Biological Control Work Plan Calendar Year 2009

Cooperator:	**Kansas Department of Agriculture, Plant Protection and Weed Control**	
State:	**Kansas**	
Project Title:	**Canada thistle (*Cirsium arvense*) Biological Control using *Ceutorhynchus litura***	
Project Coordinator:	**Laurinda Ramonda**	
Agreement Number	**09-8453-1227-CA**	
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I. BACKGROUND INFORMATION

A. Provide a brief description of the issue

Canada Thistle is a declared noxious weed in the state of Kansas and infests nearly 14,000 acres mainly in the western half of the state (2007 Annual Reports). Canada thistle's invasiveness comes from its ability to reduce crop yields, out-compete native vegetation, and its capacity to reproduce and spread rapidly with rhizomes and windborne seed. Canada thistle has the ability to reduce yields in wheat-60%, corn-81%, soybean-95%, and rangeland-60%. Considering that, Kansas ranks in the United States number one in wheat production, 10th in corn for grain, 11th for soybeans, and 5th for forage; it becomes vitally important to reduce the spread of Canada thistle. In addition, Canada thistle infests range and wildlife areas that are difficult to chemically or mechanically control. For example, Keith Sebelius Lake (Norton Lake) in northwest Kansas battles Canada thistle on a yearly basis. The difficulty of control comes from inaccessible land, low fluctuating water levels, and tree cover. To maintain wildlife habit and recreational usability of the lake, it has become important to pursue various control approaches, including biological control.

B. Indicate

Is this a new project? ☒ YES ☐ NO

Is this a continuation of a previously funded agreement? ☐ YES ☒ NO. If yes, have all progress reports been submitted? Explain.

II. OBJECTIVES, NEED FOR ASSISTANCE, BENEFITS EXPECTED

A. Specific Objectives of the Project (List if more than one)

- Release *Ceutorhynchus litura* for biological control on Canada thistle at Keith Sebelius Lake.
- Monitor *Ceutorhynchus litura* populations and Canada thistle population after release.
- Establish a insectary for future *Ceutorhynchus litura* releases in Kansas.

B. Justify how the funding will facilitate the cooperator in carrying a Biological Control Project that targets a pest of concern to APHIS

Historically, Canada thistle has been a pest of concern for APHIS. In addition, Canada thistle is a state listed noxious weed, infesting around 14,000 acres in 2007. Our goal is to establish a collectable population so that *Ceutorhynchus litura* can be spread to other parts of Keith Sebelius Lake and Kansas.

C. Indicate the economical or environmental impact of the pest (i.e., economic losses caused by the pest, mitigation costs, cost of the invasive species)

In 2007, there was 10.4 million acres of wheat, 3.9 million acres of corn, 2.6 million acres of soybeans, and 2.1 million acres of forage harvested in Kansas. In addition, the values of those crops were: wheat was $1.8 billion, Corn was $2 billion, soybeans were $891 million, and Hay was $602 million. Considering if Canada thistle has the ability to reduce yields in wheat-60%, corn-81%, soybean-95%, and range-60% and chemical control costs can range from $18 to $40 per acre reducing profits, allowing Canada thistle to continue to spread would reduce agriculture profits in Kansas significantly. Not only are there economical impacts of Canada thistle, but environmental impacts too. Canada thistle can out-compete native vegetation creating a monoculture that does not favor wildlife. In addition, the spines on the leaf of Canada thistle make recreational use around Keith Sebelius Lake difficult. Anglers and campers are limited on where they can fish and camp due to the heavy infestation around the lake.

D. Describe the expected benefits of conducting the activities in the work plan

Establishing a biological control organism will provide a longer term solution for the control of Canada thistle. In addition, a biological control organism for Canada thistle will aid in the implementation of an integrated weed management plan. Combining the efforts of chemical, mechanical and biological control will result in better weed management then chemical alone.

III. RESULTS

A. What are the anticipated results and successes?

- Reduce the spread of Canada thistle.

- Reduce the competitiveness of Canada thistle so that native vegetation will have the chance to flourish.
- Establish a insectary for future releases in Kansas

B. Describe how results will:

1. Reduce mitigation costs of managing the pest

Reduce the cost of chemical control, which can range from $18 to $40 per acre. In addition, preventing the spread of Canada thistle will reduce the future economic impact.

2. Minimize negative impacts on non-targets

Ceutorhynchus litura is approved by APHIS and has minimal non-target effect.

3. Establish biocontrol agents

Release and monitoring over a few years will hopefully provide an established population.

4. Reduce pest densities

Ceutorhynchus litura larva will feed on the crowns of Canada thistle in the spring. Exit holes will open up the plant to disease causing root and stem reduction, limit flower production, and consequently seed production.

C. Select which of the following OUTPUTS will be achieved by the termination date: (Select YES, NO, or N/A for each output) * *N/A is non-applicable.*

• New rearing techniques	☐ YES	☐ NO	☒ N/A*
• Effective or improved rearing techniques	☐ YES	☐ NO	☒ N/A
• New potential BC species identified, studied, or collected	☐ YES	☐ NO	☒ N/A
• Effective or improve field site evaluation techniques	☒ YES	☐ NO	☐ N/A
• Effective or improve surveying techniques for pest or agent	☒ YES	☐ NO	☐ N/A
• Effective or improve monitoring techniques for pest or agent	☒ YES	☐ NO	☐ N/A
• Publications or educational material	☐ YES	☒ NO	☐ N/A
• Training	☐ YES	☒ NO	☐ N/A
• Other	☐ YES	☒ NO	☐ N/A

Explain here for Other:

For OUTPUTS selected as YES, provide a description:

- Either success or failure of biological control release will help improve field site selection criteria.
- We will be surveying the Canada thistle infested area before and after biological control release.
- After the biological control release, we will monitor the site for *Ceutorhynchus litura* plant injury symptoms and adults. In addition we will monitor the Canada thistle density in the release area.

IV. APPROACH

A. Plan of Action for the proposed objectives - Describe the work to be performed under this work plan. The narrative is to include any information or data that will be shared with APHIS.

Prior to any *Ceutorhynchus litura* release, a site will be selected at Keith Sebelius Lake in Norton County in Northwest Kansas and average densities of Canada thistle will be taken in spring using a quadrat to sample the population. After site selection, newly emerged adults will be collected in the summer and released in mid-July. The adults will overwinter in the soil and emerge the next spring, synchronized with the Canada thistle development. This will allow *Ceutorhynchus litura* to lay their eggs on the new rosettes. *Ceutorhynchus litura* will be obtained from a commercial biological control company. Late summer/early fall, Canada thistle densities will be measured with a quadrat and there will be a survey to monitor the survival of *Ceutorhynchus litura* adults using a sweep net. Even with the fall density measurement, it is expected that the main effect of *Ceutorhynchus litura* on Canada thistle may not be known until the following spring,1 ½ years after release, due to winter kill of weevil damaged stems. Data will be taken with a PDA/GPS and analyzed in ArcGIS. Information on Pest and biological control organism will be shared with APHIS by entering it into the NAPIS database.

B. Indicate which of the following activities will be performed: (Select YES, NO, or N/A for each output) * *N/A is non-applicable.*

• Survey of pests	☒ YES	☐ NO	☐ N/A*
• Survey of BC agents	☐ YES	☒ NO	☐ N/A
• Environmental release of BC agents	☒ YES	☐ NO	☐ N/A
• BC agent collection – offshore	☐ YES	☐ NO	☒ N/A
• BC agent collection – field	☐ YES	☐ NO	☒ N/A
• BC agent distribution from lab or insectaries	☐ YES	☐ NO	☒ N/A
• Monitoring of pest	☒ YES	☐ NO	☐ N/A
• Monitoring of BC agents	☒ YES	☐ NO	☐ N/A
• Pre-release evaluation, development, or screenings of agent	☐ YES	☒ NO	☐ N/A
• Pre-release site selection and evaluation	☒ YES	☐ NO	☐ N/A
• Post-release site evaluation	☒ YES	☐ NO	☐ N/A
• Post-release evaluation of impacts on non-targets	☐ YES	☒ NO	☐ N/A
• Post-release evaluation of agent's efficacy	☒ YES	☐ NO	☐ N/A
• Rearing of BC agents	☐ YES	☐ NO	☒ N/A
• Mapping of pest or BC agent	☒ YES	☐ NO	☐ N/A
• Outreach or education	☒ YES	☐ NO	☐ N/A
• Training	☐ YES	☒ NO	☐ N/A
• Partnering or Networking	☒ YES	☐ NO	☐ N/A
• Techniques or methods development	☐ YES	☒ NO	☐ N/A
• Technology transfer	☐ YES	☒ NO	☐ N/A
• Other	☐ YES	☒ NO	☐ N/A

Explain here for Other:

For Activities selected as YES, provide a description:

- Prior and after biological control agent release, Canada thistle will be surveyed at release site using a quadrat to sample stem density.
- *Ceutorhynchus litura* will be released at Keith Sebelius Lake in Norton County

in Northwest Kansas.
- After biological control agent release, Canada thistle will be monitored.
- After releases, there will be a survey to monitor the survival of *Ceutorhynchus litura* adults using a sweep net.
- Prior to release, a site will be evaluated and selected based on Canada thistle density, acreage, and ease of access.
- After release, the site will be monitored for Canada thistle using a quadrat to sample stem density.
- After release, the site will be monitored for Canada thistle using a quadrat to sample stem density.
- Canada thistle populations and *Ceutorhynchus litura* will be mapped and analyzed using ArcGIS
- Information on the release *Ceutorhynchus litura* will be published on the KDA website and shared with the county weed directors of Kansas.
- The Kansas Department of Agriculture will partner with the Kansas Department of Wildlife and Parks (Agency that manages Keith Sebelius Lake) and the Bureau of Reclamation (Federal agency that owns Keith Sebelius Lake). KDWP and BOR will aid in the coordination and approval of the release site around Keith Sebelius Lake.

C. Contingencies - Include other approaches that will be considered if the work plan produces results sooner, later, or different than what you anticipate.

- Failure to establish a *Ceutorhynchus litura* population will result in additional attempts to establish this biological control organism.
- Earlier establishment will result in a collectable population allowing movement of *Ceutorhynchus litura* to other parts of the lake and other counties in Kansas.

D. What is the quantitative projection of accomplishments to be achieved?

- Establish *Ceutorhynchus litura* at Keith Sebelius Lake.
- Map and analyze data using ArcGIS.
- Submit data to NAPIS.
- Add information to KDA webpage and share information with Kansas county weed directors.

1. By activity or function, what are the anticipated accomplishments by month, quarter, or other specified intervals?

Month	**Activity**
May	Site selection for biological control agent
July	Release *Ceutorhynchus litura*
August - October	Monitor Canada thistle and *Ceutorhynchus litura*

2. What criteria will be used to evaluate the project?

- All data collected from the biological control project is entered into the state survey database and NAPIS database.
- Maps of the biological control project activities are produced to aid in decision making, control measures, and management of this pest.
- State CAPS and KDA meetings to keep updated on issues.

3. What methodology will be used to determine if identified needs are met?

- Review of the accomplishment reports and maps.
- State CAPS and KDA meetings to keep updated on issues.
- Periodic surveying of pest and biological control agent using quadrats to sample Canada thistle stem densities and sweep nets to monitor *Ceutorhynchus litura.*

4. What methodology will be used to determine if Results and benefits are achieved?

- Final map and data collected that was originally set forth in workplan.
- Infestation maps are completed and final report is sent to USDA.

VI. RESOURCES

A. What resources are required to perform the work?

- KDA staff will perform pre-site selection, releasing and monitoring activities.
- GPS unit to map, survey, and monitor release site.
- Purchase of *Ceutorhynchus litura.*
- Rental or state vehicles are required travel to and from release site.
- ATV to aid in surveying, releasing, and monitoring site.
- Provided by Cooperator, office space with associated services and utilities, computers and other office equipment for the use of Cooperator personnel. These include digital camera, PDA with GPS unit, and computer with GIS and internet service. Computers will be used for entering survey data into the state survey database and NAPIS database.

1. What numbers and types of personnel will be needed, and what will they be doing?

- KDA staff will perform pre-site selection, releasing and monitoring activities.

2. What equipment will be needed to perform the work? Include major items of equipment with a value of $5,000 or more.

- ATV

a. What equipment will be provided by the cooperator?

- ATV

b. What equipment will be provided by APHIS?

- N/A

c. What equipment will be purchased in whole or in part with APHIS funds?

- N/A

d. How will the equipment be used?

- ATV will aid in surveying, releasing, and monitoring site.

e. What is the proposed method of disposition of the equipment upon termination of the agreement/project?

- N/A

3. Identify information technology equipment, e.g., computers, and their ancillary components. ***All information technology supplies (e.g., small items of equipment, connectivity through air cards or high speed internet access, GPS units, radios for emergency operations etc.) should be specifically identified*****.**

- Computers with internet access
- PDA with GPS
- Digital camera

4. What supplies will be needed to perform the work? Identify individual supplies with a cumulative value of $5,000 or more as a separate item.

- N/A

a. What supplies will be provided by the Cooperator?

- N/A

b. What supplies will be provided by APHIS?

- N/A

c. What supplies will be purchased in whole or in part with APHIS funds?

- N/A

d. How will the supplies be used?

- N/A

e. What is the proposed method of disposition of the supplies with a cumulative value over $5,000 upon termination of the agreement/project?

- N/A

5. What procurements will be made in support of the funded project and what is the method of procurement (e.g., lease, purchase)?

(Cooperator procurements shall be in accordance with OMB Circulars A-102 or A110, as applicable.)

- Purchase *Ceutorhynchus litura*.
- The Fiscal Department at the Kansas Department of Agriculture will handle most contracts.
- Most procurements will be made by purchase.

6. What are the travel needs for the project?

- Travel will be required to survey sites by use of a KDA or rental vehicle. The KDA Plant Protection and Weed Control Plant Program Manager is the approving official. Costs are included in the financial plan.
- Lodging may be required for longer distance travel. The KDA Plant Protection and Weed Control Plant Program Manager is the approving official. Costs are included in the financial plan.

a. Is there any local travel to daily work sites? Who is the approving official? What are the methods of payment? Indicate rates and total costs in the Financial Plan.

- Travel will be required to biological control sites by use of a KDA or rental vehicle.
- The KDA Plant Protection and Weed Control Plant Program Manager is the approving official. Costs are included in the financial plan.
- The Fiscal Department at the Kansas Department of Agriculture will handle most contracts.
- Most procurements will be made by purchase.

b. What extended or overnight travel will be performed (number of trips, their purpose, and approximate dates). Who is the approving official? What is the method of payment? Indicate rates and total cost in the Financial Plan.

- The KDA Plant Protection and Weed Control Plant Program Manager is the approving official. Costs are included in the financial plan.
- The Fiscal Department at the Kansas Department of Agriculture will handle payment.
- Overnight travel will occur when visiting release site.

7. Are there any other contributing parties who will be working on the project?

☒ YES ☐ NO

If YES, answer below:

a. List Participating Agency/Institution:

- KDA Plant Protection and Weed Control
- Kansas Department of Wildlife and Parks
- United States Bureau of Reclamation

b. List all who will work on the project:

- KDA Plant Protection and Weed Control
- Kansas Department of Wildlife and Parks
- United States Bureau of Reclamation

c. Describe the nature of their effort:

- KDA will perform the site selection, biological control agent release and Canada thistle and *Ceutorhynchus litura* surveying and monitoring.
- KDWP and BOR will coordinate and approve release site.

d. Contribution:

- KDA will perform the site selection, biological control agent release and Canada thistle and *Ceutorhynchus litura* surveying and monitoring.
- KDWP and BOR will coordinate and approve release site.

VII. GEOGRAPHIC LOCATION OF PROJECT

A. Is the project statewide or in specific counties, townships, and/or national or state parks? (List all that apply)

The release site will be located at Keith Sebelius Lake (Norton Lake) in Norton County, Kansas. Norton County is located in northwest Kansas against the Nebraska border. The GPS coordinates of the lake dam are 39.804186, -99.931800.

B. What type of terrain (e.g., cropland, rangeland, woodland) will be involved in the project?

The lake site contains cropland, rangeland, and woodlands.

C. Are there any unusual features which may have an impact on the project or activity such as rivers, lakes, wild life sanctuaries, commercial beekeepers etc? (list all that apply)

The lake area includes a state park area and wildlife area, both managed by the Kansas Department of Wildlife and Parks. Within the wildlife area is rangeland, cropland, forested area, food plots, and wetlands.

D. Are there tribal lands in proximity to the project area that may be impacted, positively or negatively, by the project?

None.

VIII. DATA COLLECTION AND MAINTENANCE

A. What type of data will be collected and how will it be maintained?

- Data collection will be both electronic and visual.

B. Address timelines for collection, recording, and reporting of data.

- Survey data will be collected with GPS technology for internal pathway analyses.
- Survey maps will be developed from approved GIS mapping software.
- Complete, accurate and timely pest survey data will be entered into NAPIS using approved protocol.

C. How will APHIS be provided access to the data?

- Data is available through NAPIS access.
- Data is available through KDA.

D. Identify if the data collected relate to the following measures.
* ***N/A is non-applicable.***

• The number of BC species that become established and sustainable	☒ YES	☐ NO	☐ N/A*
• The number of BC programs that are developed, implemented, or transferred to States or others	☒ YES	☐ NO	☐ N/A
• Total number of sites that are managing targeted pests using biocontrol	☒ YES	☐ NO	☐ N/A
• Total number of new agents identified, studied, or imported	☐ YES	☐ NO	☒ N/A
• Total number of pre-release and site evaluations, or surveyed	☒ YES	☐ NO	☐ N/A
• Total number of sites monitored	☒ YES	☐ NO	☐ N/A
• Successful development of rearing and release technology	☐ YES	☐ NO	☒ N/A
• Number of eligible sites with targeted pests participating in biocontrol	☒ YES	☐ NO	☐ N/A
• Number of targeted pests managed using biocontrol	☒ YES	☐ NO	☐ N/A
• Number of publications, presentations, databases, and educational material	☐ YES	☐ NO	☒ N/A
• Number of agent colonies or insectaries created	☒ YES	☐ NO	☐ N/A
• Time of monitoring released BC agents in the field	☒ YES	☐ NO	☐ N/A
• Cost operating rearing laboratories	☐ YES	☐ NO	☒ N/A
• Total number of BC individuals reared	☐ YES	☐ NO	☒ N/A
• Total number of BC individuals released	☒ YES	☐ NO	☐ N/A
• Cost of BC individual reared	☐ YES	☐ NO	☒ N/A
• Cost of BC individual released	☒ YES	☐ NO	☐ N/A

For data variables selected as YES, provide a description:

- *Ceutorhynchus litura* will be the species that will be established and sustained.
- *Ceutorhynchus litura* will be established as a insectary and transferred to other areas of Kansas.
- The insectary will be established at Keith Sebelius Lake in Norton County, Kansas.
- Keith Sebelius Lake will be the site where Canada thistle is known to exist and where *Ceutorhynchus litura* will be released for biocontrol.
- Keith Sebelius Lake the location of pre-release and site evaluation or surveyed.
- Keith Sebelius Lake will be the site monitored.
- Keith Sebelius Lake will be the site with targeted pests participating in biocontrol.
- *Ceutorhynchus litura* will be the agent colony established as a insectary at Keith Sebelius Lake.
- After release in the spring, *Ceutorhynchus litura* will be monitored for in the field.
- The total number of *Ceutorhynchus litura* released will be 880.
- The cost of *Ceutorhynchus litura* will be approximately ($1,200/880)= $1.36 per individual

E. All survey data from federal cooperative agreements involving pest surveys, will be entered into an APHIS, PPQ approved database. The State Plant Health Director, or his/her designee, is responsible for assuring data quality.

1. If using NAPIS database.

a. First record for the State and/or County will be entered within 48 hours of confirmation of identification by a qualified identifier.

All biological control data from cooperative agreements involving pest surveys will be entered by the State Survey Coordinator or KDA staff into the state survey database and NAPIS database.

b. All other required records, both positive and negative survey data, must be entered within two weeks of confirmation.

- Complete, accurate, and timely pest survey data will be entered into NAPIS using approved protocol.
- Survey data will be collected with GPS technology for internal pathway analyses. Survey maps will be developed from approved GIS mapping software.

VIII. Reporting instructions:

A. Submit all reports to the APHIS Authorized Department Officer's Designated Representative (ADODR). Reports include:

1. Narrative accomplishment reports in the frequency and time frame specified in the Notice of Award, Article 4.
2. Financial Status Reports, SF-269, in the frequency and time frame specified in the Notice of Award, Article 4.
3. Standard Reporting Form for Biological Control Cooperative Agreements

SIGNATURES

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ROAR Date ADODR Date